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the modification comprises a reduction of AT content of the [gene] nucleic acid as it naturally occurs in the parasite by replacing [one or more] at least one AT-containing [codons] codon in the [gene] the naturally occurring nucleic acid with a preferred codon encoding the same amino acid as the replaced codon.

62
2. (Amended) [A] An isolated modified [known] nucleic acid [of] encoding a parasite protein or fragment thereof which is capable of being expressed in a mammalian cell, wherein at least one mRNA instability [motifs] motif present in the [gene] coding sequence of the nucleic acid as it naturally occurs in the parasite is eliminated by replacing at least a portion of the [said] mRNA instability motif with a preferred codon encoding the same amino acid as the [replaced codon] replaced portion of the mRNA instability motif.

3. (Amended) The modified nucleic acid of claim 1 or claim 2, wherein at least one [or more codons] codon of the [known gene] naturally occurring nucleic acid is replaced by a preferred [milk protein] mammary tissue-specific codon encoding the same amino acid as the replaced codon.

4. (Amended) [A] An isolated modified [known] nucleic acid [of] encoding a parasite protein or fragment thereof which is capable of being expressed in a mammalian cell, wherein the overall AT content of the [known gene encoding] nucleic acid as it naturally occurs in the parasite is lowered by replacement of at least one AT-containing codon in the naturally occurring nucleic acid with a [milk protein] preferred mammary tissue-specific codon encoding the same amino acid as the replaced codon, and wherein at least one mRNA instability motif present in the [gene] coding region of the nucleic acid as it naturally occurs in the parasite is eliminated by replacement of at least a portion of the instability motif with a preferred mammary tissue-specific codon encoding the same amino acid as the replaced portion of the mRNA instability motif [and at least one codon of the natural gene is replaced by a preferred milk protein specific codon].

OCT 20 2000

5. (Amended) The modified nucleic acid of claim 4, wherein ~~[said] the modified~~ nucleic acid is capable of expressing ~~[said] the~~ protein at a level which is at least 100% of that expressed by ~~[said gene]~~ the nucleic acid as it naturally occurs in the parasite in an *in vitro* or *in vivo* mammalian cell system.

Sub D¹⁰
6. (Amended) A method for preparing a modified [known] nucleic acid [of] encoding a parasite protein or fragment thereof for expression in a mammalian cell, comprising lowering the AT content of the [natural gene] nucleic acid as it naturally occurs in the parasite by replacing one or more AT-containing codons of the [natural gene] naturally occurring nucleic acid with a preferred mammary tissue-specific codon encoding the same amino acid as the replaced codon.

7. (Amended) A method for preparing a modified [known] nucleic acid [of] encoding a parasite protein or fragment thereof for expression in a mammalian cell, comprising: eliminating at least one mRNA instability motif present in the [gene] coding sequence of the nucleic acid as it naturally occurs in the parasite by replacing at least a portion of [one or more] the mRNA instability motif in the [gene] coding sequence with a preferred mammary tissue-specific codon encoding the same amino acid as the replaced [codon] portion of the mRNA instability motif.

8. (Amended) The method of claim [5] 6 or claim 7 [6], further comprising replacing [one or] more than one [codons] codon in the [natural gene] naturally occurring nucleic acid [encoding said protein] with a preferred mammary tissue-specific codon encoding the same amino acid as the replaced codon.

9. (Amended) [A] An isolated modified nucleic acid prepared by a method according to claim [5] 6 or [6] claim 7.

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sub D^H

10. (Amended) A method for preparing a modified [known] nucleic acid [of]
encoding a parasite protein or fragment thereof for expression in a mammalian cell, comprising
the steps of:

a) eliminating at least one mRNA instability motif present in the [natural gene] coding
sequence of the nucleic acid as it naturally occurs in the parasite[said protein] by replacing [one
or more] at least a portion of the mRNA instability [motifs] motif in the [gene] coding region
with a preferred [milk protein] mammary tissue-specific codon encoding the same amino acid as
the replaced [codon] portion of the mRNA instability motif;

C2
b) lowering the AT [rich] content of the [natural gene encoding said protein] nucleic acid
as it naturally occurs in the parasite by replacing [one or more] at least one AT-containing
[codons] codon of the [gene] naturally occurring nucleic acid with a [milk protein] preferred
mammary tissue-specific codon encoding the same amino acid as the replaced codon[; and

c) replacing one or more codon in the natural gene encoding said protein with a preferred
mammary specific codon encoding the same amino acid as the replaced codon], to thereby
prepare a modified nucleic acid which can be expressed in a mammalian cell.

11. (Amended) [The] An isolated modified nucleic acid prepared by the method of
claim 10

12. (Cancel) A modified nucleic acid of claim 1 wherein said parasite is malaria and
said nucleic acid is a fragment of SEQ ID NO:1 or SEQ ID NO:9 or a sequence specifically
homologous thereto.

13. (Cancel) A modified nucleic acid of claim 1 wherein said parasite is malaria and
said nucleic acid is or SEQ ID NO 9 or a fragment thereof or a sequence specifically
homologous thereto.

14. (Cancel) A modified nucleic acid that is a fragment of SEQ ID NO:1 or a
sequence specifically homologous thereto capable of being expressed in a cell culture system
wherein the AT content of the natural gene is lowered by replacement of one or more codons

with codons recognizable by said cell culture system for coding the same amino acid as the replaced codon but which effectively lower the overall AT content of the natural gene.

15. (Cancel) A modified nucleic acid that is a fragment of SEQ ID NO:1 or a sequence specifically homologous thereto capable of being expressed in a cell culture system wherein at least one mRNA instability motif present in the natural gene coding sequence is eliminated by replacing one or more codons comprising said instability motif with a codon recognizable by said cell system which effectively eliminates said instability motif and encodes the same amino acid as the replaced codon.

16. (Cancel) The modified nucleic acid of claim 14 or 15 wherein at least one or all of the codons of the natural gene are replaced with preferred codons of said cell system.

^{c3} 17. (Amended) A vector comprising the modified nucleic acid of claim [12] 4.

18. A host cell transfected or transformed with a vector of claim 17.

^{c4} 19. (Amended) A transgenic expression construct comprising the modified nucleic acid of claim [12] 4.

^{Sub D¹²} 20. (Amended) A transgenic non-human animal whose germline comprises the modified nucleic acid of claim [12] 4.

21. (Amended) A transgenic expression vector for the production of a transgenic animal comprising a promoter, operatively associated with the modified nucleic acid of claim [12] 4, wherein said promoter directs mammary gland expression of the protein encoded by said modified nucleic acid into the animal's milk.

22. (Cancel) A modified known nucleic acid of a bacterium, virus or parasite which is capable of being expressed in a cell system the AT content of the gene is lowered by replacement

of one or more with a codon recognizable by said cell system coding for the same amino acid as the replacement codon, but which effectively lower the overall AT rich content of the natural gene.

Q5- 23. (Amended) [A] An isolated modified [known] nucleic acid of a [bacterium] bacterial, [virus] viral or [parasite] parasitic protein which is capable of being expressed in a mammalian cell [system], wherein at least one mRNA instability [motifs] motif present in the [gene] coding sequence of the nucleic acid as it naturally occurs in the bacterium, virus or parasite is eliminated by replacing [one or more codons comprising said] at least a portion of the instability motif with a preferred codon [recognizable by said cell system which effectively eliminates said instability motif and encodes/encoding the same amino acid as the replaced [codon] portion of the mRNA instability motif.

24. (Amended) [A] The modified nucleic acid of claim [22 or] 23, wherein [at least one or all] more than one of the codons of the [natural gene are] nucleic acid as it naturally occurs in the bacterium, virus or parasite is replaced with a preferred [codons] codon of [said cell system].

25. A DNA vaccine comprising a modified nucleic acid according to claim 24.

26. A DNA vaccine comprising a vector according to claim 17.

Please add the following new claims 27-47 as follows:

Q6- 27. (New) The modified nucleic acid of claim 4, wherein both the AT content of the naturally occurring nucleic acid is lowered and the mRNA instability motif of the naturally occurring nucleic acid is eliminated by replacing the same codon of the naturally occurring nucleic acid with a preferred mammary tissue-specific codon.

28. (New) The modified nucleic acid of claim 4, wherein all of the mRNA instability motifs present in the naturally occurring nucleic acid are replaced by a preferred mammary tissue-specific codon.

29. (New) The modified nucleic acid of claim 4, wherein at least one additional codon other than the codon replaced to lower AT content or the codon replaced to eliminate an mRNA instability motif is replaced with a preferred mammary tissue-specific codon.

30. (New) The modified nucleic acid of claim 4, wherein all of the codons of the naturally occurring nucleic acid are replaced with a preferred mammary tissue-specific codon.

31. (New) The method of claim 10, wherein both the AT content of the naturally occurring nucleic acid is lowered and the mRNA instability motif of the naturally occurring nucleic acid is eliminated by replacing the same codon of the naturally occurring nucleic acid with a preferred mammary tissue-specific codon.

32. (New) The method of claim 10, wherein all of the mRNA instability motifs present in the naturally occurring nucleic acid are replaced by a preferred mammary tissue-specific codon.

33. (New) The method of claim 10, wherein at least one additional codon other than the codon replaced to lower AT content or the codon replaced to eliminate an mRNA instability motif is replaced with a preferred mammary tissue-specific codon.

34. (New) The method of claim 10, wherein all of the codons of the naturally occurring nucleic acid are replaced with a preferred mammary tissue-specific codon.

35. (New) The method of claim 10, wherein the modified nucleic acid is expressed by the mammalian cell at a level which is at least 25% more than the naturally occurring nucleic acid is expressed by the same type of mammalian cell.

36. (New) The method of claim 10, wherein the modified nucleic acid is expressed by the mammalian cell at a level which is at least 50% more than the naturally occurring nucleic acid is expressed by the same type of mammalian cell.

37. (New) The method of claim 10, wherein the modified nucleic acid is expressed by the mammalian cell at a level which is at least 100% more than the naturally occurring nucleic acid is expressed by the same type of mammalian cell.

38. (New) The modified nucleic acid of claim 23, wherein the preferred codon is a preferred mammary-tissue specific codon.

39. (New) The modified nucleic acid of claim 38, wherein all of the mRNA instability motifs present in the naturally occurring nucleic acid are replaced by a preferred mammary tissue-specific codon.

40. (New) The modified nucleic acid of claim 38, wherein at least one additional codon other than the codon replaced to eliminate an mRNA instability motif is replaced with a preferred mammary tissue-specific codon.

41. (New) The modified nucleic acid of claim 38, wherein all of the codons of the naturally occurring nucleic acid are replaced with a preferred mammary tissue-specific codon.

42. (New) The modified nucleic acid of claim 4, further comprising a promoter which directs mammary gland expression of the protein.

43. (New) The modified nucleic acid of claim 23, further comprising a promoter which directs mammary gland expression of the protein.